

REMARKS

Claims 1-27 are pending in the application. In the Office Action at hand, these claims are rejected.

In particular, Claims 1-4, 8-12, 14-17, 20-24, 26 and 27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Detzer and Lee. In addition, Claims 6, 7 and 19 are rejected under Section 103(a) as being unpatentable over Detzer, Lee and Aoki. Furthermore, Claims 5, 13, 18 and 25 are rejected under Section 103(a) as being unpatentable over Detzer, Lee and Jones. In response to the Section 103(a) rejections, the Applicant respectfully submits that Claims 1-27 are not obvious in view of Detzer, Lee, Aoki and Jones. Reconsideration is respectfully requested.

Claim 1 recites a method of forming a system for sterilizing air. A duct is provided for flowing air therethrough. A first electron beam generator is positioned relative to the duct for irradiating the air flowing therethrough with a first electron beam for disabling microorganisms within the air.

Claim 9 recites a method of forming an air circulation system, Claims 14, 26 and 27 recite methods of sterilizing air, and Claim 21 recites a method of sterilizing air in an air circulation system.

In the claimed invention, the electron beam emitters can be sized to provide electron beam coverage over the cross section of the duct (width and height), for example as shown in FIGs. 1 and 4. Virtually all the air that flows through the duct can pass through the electron beam and be irradiated, thereby disabling microorganisms within the flowing air. The electron beam can disable or kill airborne microorganisms flowing in the air by damaging the DNA and/or structural matter, thereby sterilizing the air. Disablement of microorganisms by electron beam can be much faster and thorough than prior methods, such as by ozone or UV light which typically requires longer exposure to be effective.

In contrast, Detzer discloses a conditioner for air having an air conditioner 1, a fan 2, and a duct 17 through which air flows from the air conditioner 1. An oxidizing unit 3 on the duct 17 receives ozone from an ozonator 5 for oxidizing pollutants flowing in the air, typically VOCs.

Column 2, lines 66-68 disclose that bacteria living on wet condenser coils can be eliminated. The ozone can then be removed with a filter 6. Detzer does not have an electron beam generator.

Lee discloses an apparatus for removing harmful gases, for example NO_x , SO_x and HC. The gases are treated by reaction units 100 (FIG. 1). In a reaction unit 100, electricity travels from the electrodes 111 of discharge cells 110 (FIG. 3) radially inwardly to the outer cylindrical surfaces of a cylindrical electron beam pole 120 (FIG. 2), thereby forming an annular reaction region of electricity and laser beams. The electrodes 111 and electron beam pole 120 form a capacitor as shown in FIG. 18 (Col. 11, lines 64-67). Column 12, lines 21-37 discloses that the apparatus can be used as a sterilizer due to the ozone generating function. Consequently, Lee teaches sterilization by ozone, and does not teach or suggest sterilization by irradiation with electrons. Therefore, the combination of Detzer with Lee according to the teachings of Lee would not result in the claimed invention, but would instead result in the reaction units 100 of Lee being positioned at the ozonator 5 of Detzer to provide ozone to the oxidizing unit 3 of Detzer for sterilization by ozone.

Accordingly, Claims 1-4, 8-12, 14-17, 20-24, 26 and 27 are not obvious in view of Detzer and Lee, since neither reference, alone or in combination, teaches nor suggests "positioning a first electron beam generator relative to the duct for irradiating the air flowing therethrough with a first electron beam, the first electron beam for disabling microorganisms within the air", as recited in base Claim 1, and similarly in base Claims 9, 14, 21 and 26, or "directing an electron beam into a sterilization chamber; and directing the air into the sterilization chamber generally against the direction of the electron beam and redirecting the air generally along the direction of the electron beam for irradiating the air and disabling microorganisms in the air", as recited in base Claim 27. Therefore, Claims 1-4, 8-12, 14-17, 20-24, 26 and 27 are in condition for allowance. Reconsideration is respectfully requested.

Aoki discloses treating waste gases having SO_x and NO_x with electron beams. Aoki does not teach or suggest sterilizing air.

Accordingly, Claims 6, 7 and 19 are not obvious in view of Detzer, Lee and Aoki since none of the references, alone or in combination, teach or suggest "positioning a first electron beam generator relative to the duct for irradiating the air flowing therethrough with a first electron beam, the first electron beam for disabling microorganisms within the air", as recited in

base Claim 1 and similarly in base Claim 14. Therefore, Claims 6, 7 and 19 are in condition for allowance. Reconsideration is respectfully requested.

Jones discloses an air purification system which employs a UV lamp 80 positioned within a section 60 having polished light reflective surface. Jones does not teach or suggest sterilizing with an electron beam, or a reflector for reflecting electron beams.

Accordingly, Claims 5, 13, 18 and 25 are not obvious in view of Detzer, Lee and Jones since none of the references, alone or in combination, teach or suggest "positioning a first electron beam generator relative to the duct for irradiating the air flowing therethrough with a first electron beam, the first electron beam for disabling microorganisms within the air", as recited in base Claim 1, or similarly in base Claims 9, 14 and 21. Therefore, Claims 5, 13, 18 and 25 are in condition for allowance. Reconsideration is respectfully requested.

CONCLUSION

In view of the above remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

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